

**SECTION 15110
PROCESS WASTE DRAINS OUTSIDE BUILDINGS**

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Polypropylene piping systems for process waste drain (PD) service with 160°F (71°C) maximum temperature for installation below grade and outside of buildings.

1.2 RELATED SECTIONS

- A. Section 02222, Excavation for Utilities.
- B. Section 15050, Piping Systems.
- C. Section 15073, Pressure/Leak Testing.
- D. Section 15074, Identification and Labeling.

1.3 REFERENCES

- A. ASTM D2122-98, Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.
- B. ASTM D2321-00, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications.
- C. ASTM D2657-97, Standard for Heat Fusion Joining of Polyolefin Pipe and Fittings.
- D. ASTM D2837-98a, Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
- E. ASTM D4101-00, Standard Specification for Propylene Plastic Injection and Extrusion Materials.
- F. ASTM F1412-00, Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems.
- G. ASTM F412-00, Standard Terminology Relating to plastic Piping Systems.
- H. Standard Plumbing Code, Southern Building Code Congress International Incorporated (1997).

PART 2 - PRODUCTS

2.1 MATERIALS: Use materials selected from list below [except where specified otherwise].

- A. Polypropylene Piping: Type II Polypropylene (copolymer) manufactured in accordance with ASTM D4101 and conforming to ASTM D2837 for hydrostatic design basis.
 - 1. Pipe (1 in. to 4 in.): Polypropylene piping, socket fusion type, ASTM F1412.
 - 2. Fittings (1 in. to 4 in.): Polypropylene, Socket-fusion type, ASTM F1412.
 - 3. Pipe (6 in. to 10 in.) Polypropylene piping, Butt fusion type, ASTM F1412.
 - 4. Fittings (6 in. to 10 in.) Polypropylene, Butt fusion type, ASTM F1412.
- B. Detector Tape
 - 1. Mylar encased aluminum foil, color per Section 15074, with "CAUTION: BURIED PROCESS WASTE BELOW" printed thereon.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All pipe, fittings, valves, and materials shall be stored in a sheltered location, out of direct sunlight and between 40 degrees and 90 degrees F. Pipe, fittings and valves shall be stored and handled in such a manner as to prevent damage. Any materials that become damaged must be replaced with new, clean material.
- B. In the event that the following procedures vary from those of the material manufacturers, the manufacturer's procedure shall govern. All rigid Polypropylene waste pipe (PD) shall be cut, made up and installed in accordance with the manufacturer's instructions. The CM shall be notified in writing of any such variance.
- C. Install piping system per ASTM D2321, the Standard Plumbing Code and Section 15050.
- D. Slope gravity PD lines outside buildings at a minimum pitch of 0.125 in./ft for pipe sizes 3 in. and larger. Pipe sizes smaller than 3 in. shall slope at 0.25 in./ft.
- E. Securely support exposed horizontal runs of piping at each hub or at maximum intervals of 48 inches for plastic pipe. Install supports for vertical piping every 48 inches. Install plastic process drain pipe per ASTM D2321.
- F. Make Thermoplastic Heat Fusion Joints per ASTM D2657.
- G. Use only Polypropylene pipe and fittings. All drain pipe, drain fittings and joint fusion power units shall be obtained from the same manufacturer.
- H. Pipe shall not be laid when the temperature is below 40 degrees F or above 90 degrees F or when exposed to direct sunlight. Ends to be joined shall be shielded from direct sunlight prior to and during the laying operation.
- I. If atmospheric temperature is below 40 degrees F, joints must be prefabricated in a heated space, or a temporary heated enclosure must be provided during entire joining period and for 2 hours after joint is made up. All materials must be stored in heated area.
- J. Do not fusion weld in direct raining weather.
- K. Provide plumbing fixtures and equipment (including floor drains) discharging into the process waste system with traps located as near as possible to fixtures or equipment.
- L. Form cleanouts by using tee or "Y" pattern branch fittings with similar plastic screw plugs. For pipe up to 4 in., use cleanout plugs same size as pipe. For pipe greater than 4 in., use 4-in. cleanout plugs.
- M. Provide cleanout plugs at foot of new vent stacks.
- N. Identification/Labeling: Sect. 15074.
- O. Joints and adjacent piping shall not be moved after joining for the periods of time specified in Table 1.
- P. Test pressure shall not be applied after joining for the minimum times specified in Table 2.

Table 1
Surface Temperatures

Pipe Size (Inches)	Hot Weather 90-150 Degrees F	Mild Weather 50-90 Degrees F	Cold Weather 10-50 Degrees F
1 ½ to 8	15 minutes	10 minutes	5 minutes
10 to 12	30 minutes	20 minutes	15 minutes

Table 2
Surface Temperatures

Pipe Size (Inches)	Hot Weather 90-150 Degrees F	Mild Weather 50-90 Degrees F	Cold Weather 10-50 Degrees F
1 ½ to 8	20 minutes	10 minutes	10 minutes
10 to 12	60 minutes	30 minutes	30 hours

3.2 REPAIR/RESTORATION

- A. Replace defective, broken, or cracked pipe and fittings.

3.3 FIELD QUALITY CONTROL

- A. Pressure/Leak Test: Section 15073, Class C.

3.4 CLEANING

- A. Clean Process Waste Drain Piping outside of Buildings in accordance with: Section 15072, Cleaning.

END OF SECTION 15110